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Climate Change Mitigation by Quantification of Greenhouse Gas Emissions from Office Operations of a Global Logistics Company

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Abstract

Climate change is a global phenomenon that affects all continents. Climate change has become the most discussed topic in the last decade, owing to the increasing probability of extreme events occurring. Mitigation of climate change focuses on avoiding and reducing greenhouse gas emissions into the atmosphere. The industrial sector significantly contributes to anthropogenic greenhouse gas (GHG) emissions, which are one of the primary causes of climate change. Calculating a company's carbon footprint (CF) is an important step toward reducing quantifiable emissions because it indicates the contribution of each activity to GHG emissions. The objectives of this study were to identify the major contributors to organizational GHG emissions and provide possible solutions for emission reduction. This research examines the organizational CF of a logistics company for a year, from April 2020 to March 2021. That global company, which has more than 2,900 employees in 32 countries and provides freighting, warehousing, and other solutions to the community, contributes to GHG emissions through freight transport and office operations. Office operations were considered here, and operational boundaries were established within offices in fourteen countries. GHG Protocol was chosen as the methodology for quantifying the organization's CF. GHG emitting activities were identified and classified into three categories under the GHG protocol. Secondary data was collected from the company database called Sustainable Management System for the calculation, and invoices and bills were checked to ensure data accuracy. To extract emission factors, publications from the United Kingdom's Department for Environment, Food and Rural Affairs (DEFRA), the Sri Lanka Sustainable Energy Authority website, the Institute of Global Environmental Strategies (IGES) list of grid emission factors, and the World Bank Open Database were consulted. The annual carbon footprint was 3,710 tCO_{2e}. The highest emission value resulted from indirect emissions associated with purchased electricity, which is 2,180 tCO_{2e} and accounts for 58.8% of the company's annual carbon footprint. The proportions of direct and other indirect emissions were reported to be 14.4% and 26.8%, respectively. Per capita consumption for the company was 2.18 tCO_{2e}. The highest per capita consumption was reported from the stations in Sri Lanka which was 4.57 tCO_{2e}. To reduce greenhouse gas emissions, measures such as implementing solar energy systems and setting emission reduction targets are proposed as the major suggestions. This study is a part of the initiatives undertaken by the company to reduce its GHG emissions.

Keywords: Carbon footprint, Climate change, Mitigation, GHG emissions